which I have the honour to be a member, but it is a large problem which it has to face, and it is to be hoped that its publication will not fall too much into the way of merely publishing solutions of interesting and sometimes recondite conundrums.

I should like to see a more rational form of geometrical text-book in common use, in which many of the propositions of the second and fifth books are merely translated into algebraical language, and ratios and symbols more widely employed in the sixth book to shorten many of the propositions.

Again, no doubt, trigonometry is postponed till too late a date, and in many cases it is not begun at school at all. Why should not every one gain a reasonable notion of the sines, cosines and tangents of angles at a much earlier stage in order to supplement his knowledge of geometry? I would not recommend a beginner to employ himself for hours, as is often the case, in proving long, and to him cumbrous, identities, but leave such work to the professed mathematician. It would be more profitable for the boy to plot out graphs of the simpler functions on squared paper and thereby gain an early notion of coordinates. He should also be taught much earlier a practical working of logarithms, and not postpone it until perhaps he has got beyond the binomial and experimental theorems.

What do we find, too, in the teaching of elementary algebra? There seem to be the same unpractical methods at work here. Boys spend considerable time over the ordinary rules in the early part of their text-books, and often no suggestion is made to them that algebra is but a convenient method of expressing general ideas in a shorthand form. The fundamental notions of ratio, proportion or variation are kept from them because, if you please, the chapters on them are printed somewhat late in their text-books! Too frequently the average question merely involves a bristling array of letters and brackets which have to be simply eliminated or removed. Seldom is an appeal made to a boy's faculties of sight and touch, and seldom is any apparatus for measurement placed in his way. The present order of things may not do much harm to the boy of mathematical ability, if he means to make a special study of the subject; but for the rank and file it is wrong, if they are to coordinate their mathematics with a good working knowledge of the calculus of experimental science.

Here I must make mention of a very valuable article by Prof. Perry in NATURE of August 2, 1900, and I only regret that, as I was away at the time, I was not aware earlier of its existence. I need only say that I am heartily in accord with him in advocating some such scheme as he there proposes. To turn now to what I hope may prove a practical suggestion. It would not be possible to change abruptly from the present arrangement to such a scheme; but the process could certainly be gradual, and a larger, gradually increasing, proportion of hours for experimental work might well be introduced into the curriculum. Surely the University of Cambridge might lead the way and bring into its previous examination some form of physical science, theoretical and practical, in order that all young men may obtain some idea of the practical applications of mathematics. Why is it that so many young men at Cambridge find the subject of physics so difficult, and are sometimes induced to abandon it for some other form of science? My answer is that their previous mathematical education has often been conducted on the wrong lines, and their knowledge is not of that kind which is required of them in the laboratories.

The University of Oxford is, however, a far worse offender in its mathematical papers for responsions and matriculation. The arithmetical papers set are thoroughly on the orthodox lines, and this is very well as far as it goes; but there is no hint of any application of arithmetic to practical work. The rest of the mathematics required is truly ridiculous; a candidate may either take an elementary algebra paper, carrying him about half-way through the subject, or a paper on the first two books of Euclid, and the latter alternative is strongly recommended by the authorities. Note that he must not take *both* subjects, so that the candidate is given to understand that these two subjects are divided off into separate compartments, and may have no more relation to one another than biology has to Greek iambics. Moreover, from what I understood in a speech at the Conference of Science Masters, a young man who would offer physics for a scholarship does not always meet with the encouragement he deserves from the authorities at certain colleges, and *a fortiori* no pass candidate is expected to even trouble himself about the subject.

With these difficulties in our way it cannot be expected that very much towards realising Prof. Perry's ideal has yet been achieved; but, in addition to what I have said, there is no doubt that the number of hours given to the study of mathematics or physics at our older public schools is woefully inadequate. It is useless to say that so much money is spent on these subjects. Unless more time is given to them for each individual boy, satisfactory results cannot be produced, much less can an advance be made towards coordinating the two subjects.

A great debt of gratitude is due to men like the late Prof. Huxley in furthering the cause of science in the public schools, but we do not want to stay where we are. An answer to the practical question of how we are to fit more time into the working day involves the removal of compulsory Greek and an alteration of the classical scheme. Education is very much in the air just now, and when Lord Rosebery, Sir John Williams and others, in the last few months, speak publicly upon this subject, it is greatly to be hoped that reforms will be brought about.

The old theory is, that it does not much matter what a boy is taught at school provided he is made to work. This, to my mind, is a most mischievous doctrine. The average boy has only a limited capacity and a limited time for learning to fit himself for his life's work, and it must be discouraging to him to find, when he leaves school, that he knows absolutely nothing about the work by which he may be going to earn his bread. Not every boy is capable of becoming a classical scholar with a fine critical instinct; let those who are by all means be encouraged in every possible way. But it is for the average boy that I plead, and I ask why so much of the old studies should be thrust down his throat when modern life will require of him a knowledge of a great deal besides.

I do not desire to enter into a long discussion of the merits of a classical education, but in the older public schools some change must be brought about if we are to devote more time to modern subjects, and it is for this reason that I have introduced the question here. A spirit of quasi-mediævalism still seems to be numbing the existence and warping the educational growth of these schools. Far better would it be if a change came about from within; but will anything short of another Royal Commission bring about the necessary reforms?

Athletics fill a large part of school life, and it is natural that they should appear important on a healthy boy's horizon. It is, therefore, all the more necessary he should be properly guided in his work before the time comes when he can judge for himself. Perhaps too much time may be given to sports; be that as it may, a boy in each day cannot work more than a certain number of hours, but while he is at work, for heaven's sake let us teach him more of the things which are likely to stand by him afterwards. I have too much respect for the older public schools to wish to see them left behind in the race by vigorous younger sisters; but we, who are concerned with such schools, cannot shut our ears to the peremptory demands for a more rational education, if our national life and character are to play the same part in the future that they have done in the past.

G. H. J. HURST.

Eton College, Windsor, February 12.

The Use of Mosquito Curtains as Protection against Malaria.

IN your issue of December 20, 1900, is described the use of mosquito curtains against malaria in Egypt. It is, I suppose, generally known that in India they have been used for many years in a similar fashion. Between 1872 and 1883 I travelled and camped in some of the most malarious jungles in India. Sometimes I had to travel, like a Boer, in light marching order; but mosquito curtains, I can well remember, were the last things to be left behind. Their efficacy in those days was attributed to a filtering action; and, following out this idea, I used (especially in very feverish districts) to employ curtains composed of thin porous sheeting. I can still recollect the various stories of the efficacy of mosquito curtains against malaria.

There seems to be an opinion amongst men who go north into the malarial districts of Rhodesia, &c., that Dr. Ross's splendid discovery does not cover quite the whole ground. One can recollect how, in certain countries, certain winds (apart from mosquitoes) inevitably bring attacks of fever, even in those who are apparently free at the time from infection. On the Nilgiris, in Southern India, between 6000 and 7000 feet high,

malarial fever is unknown on the spot, but a man may turn over the ground in certain marshy localities and get fever certainly whenever he does so. It was common experience in India that the drinking of certain water, such as that from the highly malarious Western Ghaut forests, would inevitably cause malarial fever.

In many malarious localities, especially parts of China, it is sufficient to turn the ground over to apparently poison the atmosphere and induce malaria in those who are near. There is a medically authenticated case of fever being contracted from newly turned-up earth carried in baskets by coolies past a window. When this and other cases come to be re-examined they may be found traceable to mosquito-born Hæmamœbidæ; but it is difficult to account for them all in this way, and, as I mentioned, there seems to be an opinion amongst Northern men here that all cases of malarial fever cannot be attributed to Anopheles infection. D. E. HUTCHINS.

Conservator of Forests, Cape Town, January 19.

Audibility of the Sound of Firing on February 1.

I ENCLOSE a record of the sound of the guns heard at Eastbourne, commencing at 3h. 14m. and ending at 3h. 57m. As you will see, the sounds came with great regularity every minute, but the period which the sound covered in each minute gradually fell off from eleven to about five seconds. My observations were checked by a friend, and we were stationed on the summit of a down some 500 feet above sea level with a clear sea horizon out to Newhaven. The distance to the Solent is about sixty-five miles, and there was a slight wind from the North-West. I should like to try to describe the sounds which, though faint, were perfectly distinct—er-er-er-pup-er-er-pup-pup, the detonation sound being more marked towards the end of each period. I need not say that the sounds were indescribably mournful to listen to. H. D. G.

Audibility of the Sound of Firing on February 1st.

Sound commenced at h. m. s.	Sound ended at h. m. s.	Duration of sound s.
3 14 7	3 14 18	11
3 15 8	3 15 19	11
3 16 8	3 16 18	10
3 17 8	3 17 19	11
3 18 8	3 18 19	11
3 19 8	3 19 19	11
Observations interrupted by the rumbling of the wheels of a cart about a quarter of a mile distant.		
3 23 11	3 23 19	8
3 24 12	3 24 19	7
Observations again broken by sounds of a distant cart.		
3 27 13	3 27 19	6
3 28 13	3 28 18	5
3 29 11	3 29 17	6
3 30 11	3 30 16	5
3 31 12	3 31 16	4
3 32 12	3 32 13 (?)	1
3 33 12	3 33 16	4
3 34 11	3 34 15	4
3 35 11	3 35 15	4
3 36 11	3 36 15	4
3 37 11	3 37 15	4
3 38 10	3 38 16	6
3 39 10	3 39 17	7
3 40 11	3 40 15	4
3 41 10	3 41 15	5
3 42 10	3 42 15	5
3 43 10	3 43 15	5
3 44 10	3 44 15	5
Observations again interrupted.		
3 46 11	3 46 14	3
3 47 10	3 47 16	6
3 48 9	3 48 15	6
3 49 9	3 49 15	6
3 50 10	3 50 15	5
Failed to hear sound—reports growing fewer and very faint.		
3 52 13	3 52 16	3
3 53 10	3 53 15	5
3 54 11	3 54 14	3
Reports continued until 3 57—but impossible to time —so very faint.		

Sensational Newspaper Reports as to Physiological Action of Common Salt.

IN the interest of the dignity of scientific research I venture to hope you will print the following statement. Some American papers have recently published sensational and absurd reports of physiological theories and experiments whose authorship they attributed to me. These reports, which in America nobody takes seriously, were reprinted and discussed in European papers. I hardly need to state that I am in no way responsible for the journalistic idiosyncrasies of newspaper reporters and that for the publication of my experiments or views I choose scientific journals and not the daily Press. JACQUES LOEB.

The University of Chicago, Physiological Laboratory, January 16.

The Publication of Books without Dates

Is it not time that men of science should raise a protest against the publication of books without a date on their title-page? This is a practice which has been common to maps and a certain class of books of reference, and it comes, to my mind, very near to being a deliberate fraud, as it seeks to pass off as new that which is more or less obsolete. We should surely do our utmost to prevent this habit from spreading to scientific books, such as the translation of van 't Hoff's "Physical Chemistry," which is reviewed in NATURE of February 7.

O. HENRICI.

Central Institution, Exhibition Road, February 9.

Optical Illusion.

IT seems to me certain that the phenomenon illustrated in NATURE of February 7 (p. 353) is due to (1) *fatigue*, the cause of the reversed image seen when one looks away from the diagram on to white paper, combined with (2) *involuntary and incessant slight movements of the eye.*

Of course the reversed image, white squares and black lines, when one looks away on to white paper, is well known. With me it does not appear to occur at once, but after an interval; and it is intermittent, fading and recurring several times.

Now, when one gazes at the diagram, the eye moves incessantly to a slight extent; and so it is only the central part of the images of the white spaces that fall always on parts of the retina continually fatigued; the edges, near the black squares, fall on parts of the retina that have, on the whole, a good deal of rest owing to the fact that they are occupied for half the time (or so) by the images of the black squares. I do, in fact, see dark lines along the central portions of the white spaces, and the dark patches spoken of are where these dark lines cross.

I can make the horizontal dark lines disappear by purposely giving my eyes a more than slight movement up and down the vertical white spaces. Then the vertical shadowy lines, in the middle of these spaces, remain; the horizontal dark lines vanish, as should be the case.

As regards the "vanishing" of a patch looked at, I do not find this to be a correct account of what I observe. I notice that when I suddenly gaze at any one crossing, the crossing dark lines and dark patch at that place take longer to appear; but they do appear in time. Perhaps the "yellow spot" is slower in action than the rest of the retina in questions of fatigue? But these phenomena are difficult to observe, as the eyes soon tire. A very noticeable phenomenon, I suppose an extreme case of fatigue, is the following. When I gaze for a long time, white spaces here and there disappear altogether in a fitful manner, the squares concerned for the time blending. This occurs with monocular vision as well as binocular, as do all the phenomena mentioned. But I think the eyes must be very tired for this to occur.

As regards the question of spacing, I imagine that the steadier the eye-muscles, and so the less the involuntary movements, the narrower might be the white spaces. I have noticed a violet margin round an orange on snow, due to the same causes. It increased when the orange was rolled. The explanation is obvious if the view taken above is right. W. LARDEN.

R.N.E. College, Devonport.

Some Animals Exterminated during the Nineteenth Century.

Re the very interesting article published under the above-mentioned title by Mr. R. Lydekker (p. 252, January 10), may I indicate and correct an error? *Camptolaemus labradorius* is certainly exterminated on the North Atlantic coast of America, as Mr. Lydekker says; but this breed still exists not very far off, but in a somewhat out-of-the-way place, in the island of Anticosti, where M. Paul Combes saw it recently, as he states the fact in his "Exploration de l'Ile d'Anticosti," 1896 (J. Andrè, publisher, Paris). HENRY DE VARIGNY.

Paris.

IN reference to the foregoing letter, it may be mentioned that the duck in question is entered as extinct in the "A.O.U. Check-list of North American Birds," 2nd ed. p. 56 (1895), and no information has subsequently reached this country as to its alleged survival in Anticosti. R. L.